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The Hemp Program offers this guide to registrants on how to take representative samples of trim flower, hemp concentrate, hemp products or hemp-infused products or remediated hemp crops after approval of a corrective action plan in accordance with section 9.1(b) and Section 14 of the Vermont Hemp Rules. Ensuring that samples are representative of lots is important for the purposes of compliance with the Vermont Hemp Program Rules that address potency and contaminant testing, including pesticides, heavy metals, mycotoxins, bacterial or fungal contaminants by sample type. Appropriate sampling and testing by lot will influence next steps in processing, labeling, and ensure compliance with the Vermont Hemp Program.

It is important to obtain a composite representative sample for analytical testing. Registrants must maintain by harvest or process lot number:

- Copies of records as required by the Vermont Hemp Rules for harvest lots that are used to formulate each concentrate or hemp product or hemp-infused product,
- The standard operating procedure for formulating each product,
- Certificates of analyses from certified laboratories demonstrating the cannabinoid content of each product that has a label guarantee, and
- A copy of each product's label.

1. Definitions:

1. **Agency** means the Vermont Agency of Agriculture, Food and Markets.
2. **Biomass** means harvested hemp including the stalks and leaves and may include flowers/buds and/or seeds.
3. **Certificate of analysis** means a certified laboratory's report describing its analytical testing and results.
4. **Certified laboratory** means a laboratory certified by the Agency under 6 V.S.A. § 567.
5. **Composite sample** means the collection of all sample increments from a single lot, combined into one container, to be tested by a certified laboratory.
6. **Consumption** means human ingestion, inhaling, or topically applying to skin or hair.
7. **Contaminant** means a pesticide, solvent, heavy metal, mycotoxin, foreign material, bacterial and/or fungal impurity introduced through cultivation or processing.
8. **Harvest lot** means a grower's harvested hemp produced during a single growing season in a contiguous area containing the same cultivar or variety.
9. **Hemp** means the plant *Cannabis sativa* L. and any part of the plant, including the seeds and all derivatives, extracts, cannabinoids, acids, salts, isomers, and salts of isomers, whether growing or not, with the federally defined tetrahydrocannabinol concentration level.

10. **Hemp concentrate** means a process intermediate obtained by separating cannabinoids from a hemp crop using a mechanical, chemical, or other process which consists primarily of cannabinoids. Hemp concentrate is not a hemp product or hemp-infused product as defined by the Vermont Hemp Rules.
11. **Hemp crop** means a standing or harvested crop or biomass. Use of “hemp crop” or “hemp crops” includes both the singular and plural usages whenever appropriate and shall be read to be inclusive of both forms whenever possible.
12. **Hemp product or Hemp-infused product** means all product that satisfies the required tetrahydrocannabinol concentration level for hemp, derived from, or made by, processing hemp plants and/or plant parts, that are prepared in a form available for commercial sale, including cosmetics, personal care products, food intended for animal or human consumption, cloth, cordage, fiber, fuel, paint, paper, construction materials, plastics, and any product containing one or more hemp-derived cannabinoids, such as cannabidiol.
13. **Process** means a processor’s storing, drying, trimming, handling, compounding, and/or conversion of hemp crops into hemp products or hemp-infused products. “Process” includes processing hemp from single or multiple growers, and transporting, aggregating, or packaging hemp. “Process” also includes manufacturing hemp products or hemp-infused products from hemp concentrate.
14. **Processor** means a person who is registered with the Agency to process hemp crops. A retail establishment selling hemp products or hemp-infused products is not a processor.
15. **Process lot** means any amount of hemp concentrate, hemp product or hemp-infused product of the same type, processed at the same time using the same ingredients and same standard operating procedures.
16. **Registrant** means a person registered with the Hemp Program.
17. **Remediation** means techniques utilized to transform non-compliant cannabis into something useful and compliant while disposing of non-compliant parts. Remediation can occur by removing and destroying flower material, while retaining stalk, stems, leaf material, and seeds. Remediation can also occur by shredding the entire plant into a biomass like material, then re-testing the shredded biomass material for compliance.
18. **Sample increment** means a single increment taken from a process lot.
19. **Serving** means the amount or size of product to be consumed as labeled and determined by the registered processor.

2. Representative Composite Sample Collection

There are five steps to representative sample collection, including:

1. determining the number of required tests for compliance purposes of the material to be tested (table 1 end of document),

2. confirming the amount of composite sample needed by the laboratory in order to conduct the required compliance analytical tests,
3. determining the number of sample increments of the material to collect based on amount in kilograms in the process lot, these increments will make up the representative composite sample (tables 2-4 end of document),
4. following the diagrams for mixing and collecting the required sample increments that make up a representative composite sample, and
5. collecting the representative composite sample and document the sampling process.

2.1 Required Tests

All Hemp Program processor registrants must maintain results for all compliance testing of process lots as required by the Vermont Hemp Rules and in the Cannabis Quality Control Program. This necessitates collecting a representative composite sample from process lots of hemp trim flower, hemp concentrates, hemp products, hemp-infused products, or remediated hemp crops. Table 1 (all tables at end of this document) shows required testing for potency and/or targeted contaminant, categorized by product type: trim flower, solid or liquid concentrate, or solid or liquid hemp or hemp-infused product.

Registered hemp growers with pre-harvest analytical test results exceeding the federally defined tetrahydrocannabinol concentration level may propose a corrective action plan to remediate the harvest lot for review and approval by the Agency.

2.2 Amount needed for laboratory testing

Please check with the certified laboratory to understand the required amount of representative composite sample needed to conduct all required testing, then divide by the number of sample increments outlined in step 2.3 (Tables 2 through 4) to determine each increment's weight or size. A minimum representative composite sample size may be approximately 2 grams for each analysis. Microbiological analysis may require approximately 1 gram for concentrates, and 5 grams for trim flower.

2.3 Number of sample increments to collect

To determine the number of sample increments to collect, refer to the appropriate reference table 2 through 4 for the type of material to be sampled. The number of the sample increments taken is based on the type and volume of the material in the process lot. These sample increments will make up the representative composite sample. The volume of material is based on the required tests in Table 1, and is determined by the certified laboratory running the tests. A registrant may choose to run additional tests, which may require additional material.

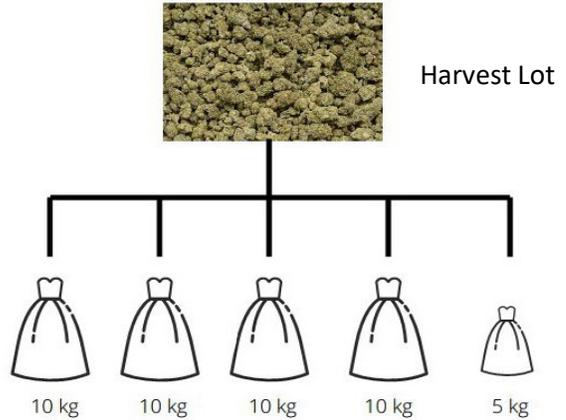
For example, from Table 1, a trim flower process lot must be tested for moisture/ water activity, and microbiological contaminants (which are three tests – total aerobic bacteria, total combined yeast and mold, and mycotoxins). If the trim flower lot weighs less than 2.5 kg, using Table 2, a minimum of 13 individual sample increments must be taken to create a representative composite sample. If 6.5 grams is required by the certified laboratory (see section 2.2), each of the 13 sample increments should weigh approximately 0.5 grams each.

2.4 Diagrams for mixing and collecting representative samples

Use the diagram that matches your process lot sample type. Follow the directions for mixing lots and collecting individual sample increments that will make up the representative composite sample.

Diagram 1 is a 45 kg harvest lot, that has been divided into five trim flower process lots

Four 10 kg process lots and one 5 kg process lot



Using diagram 1, divide each container into 3 sections. Use a sterilized spatula or forceps to randomly obtain sample increments. For a 10 kg trimmed flower process lot, take 22 equal sample increments. Take 1/3 of increments from each section of the container (shown on diagram). Combine all sample increments to form the composite sample for laboratory testing.

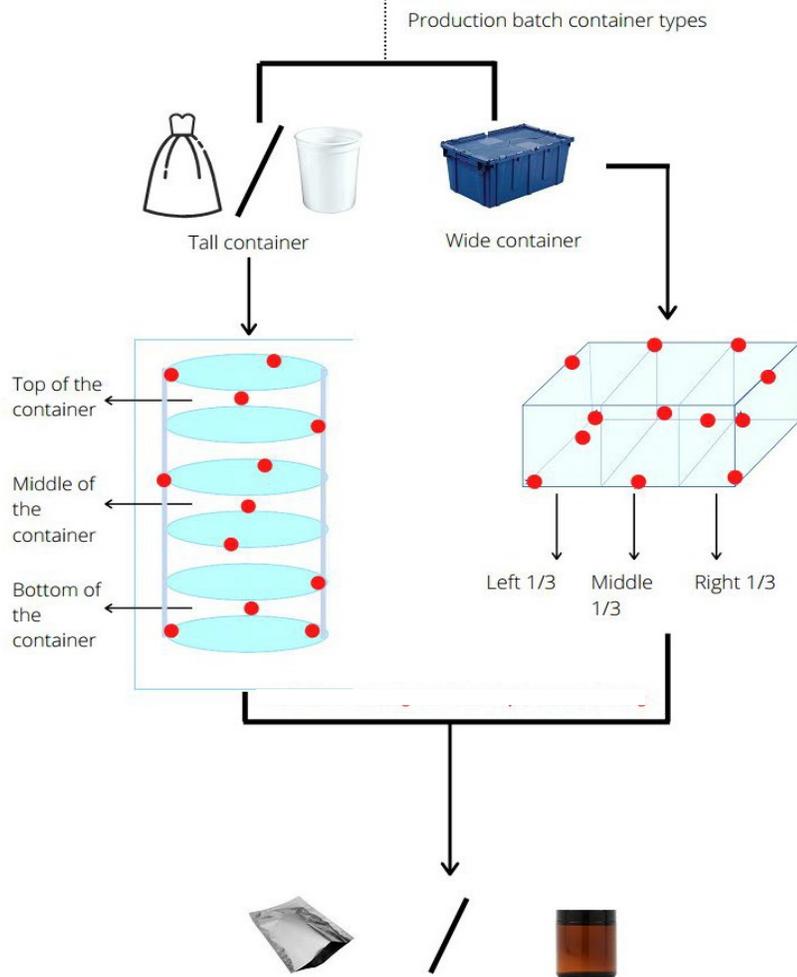


Diagram 2, example of 1 kg of liquid tincture or concentrate

Bring the liquid to room temperature. Invert the container 3 times, then mix thoroughly.

Divide the container into 3 sections. Use a pipet or appropriate equipment to randomly obtain sample increments, taking 1/3 of all increments from each section. For each 1 kg liquid, take 16 equal increments. Eighteen increments may be taken to allow 6 increments from each part. Combine all sample increments to form the composite sample for laboratory testing.

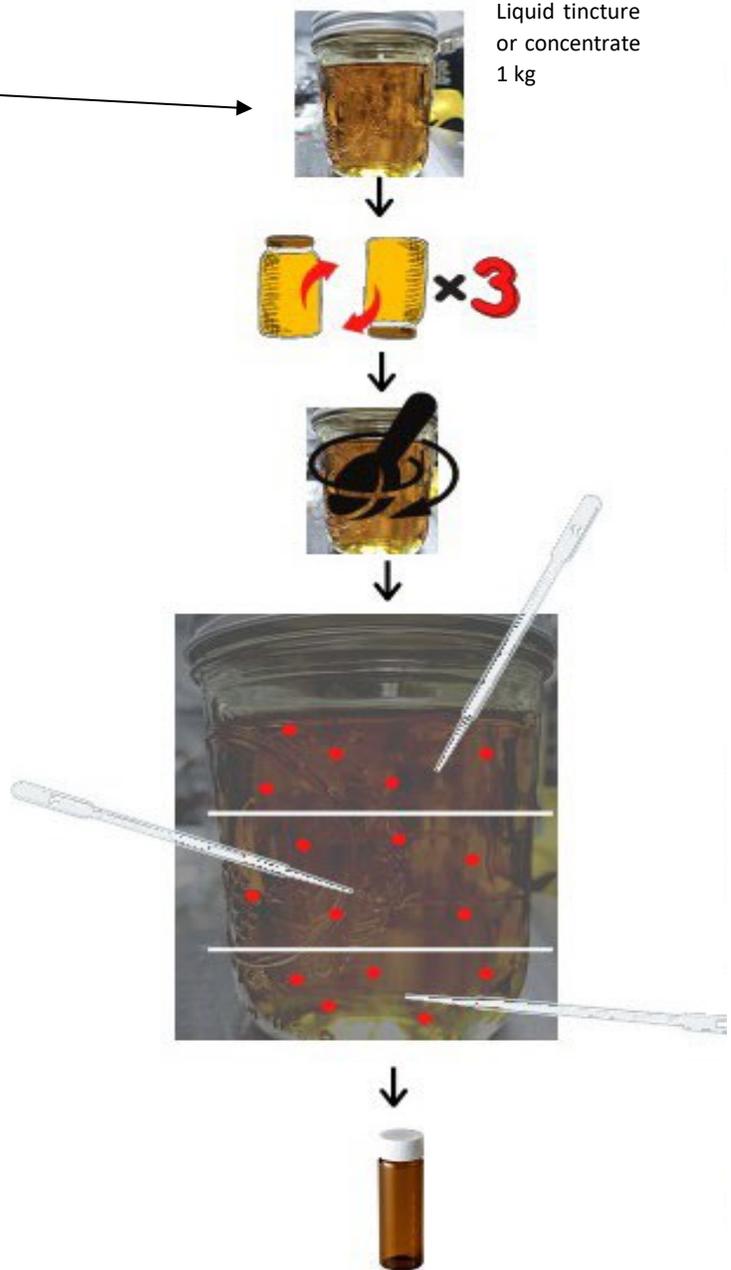


Diagram 3, 1 kg of solid or semi solid concentrate

Divide the process lot into 3 sections. Use a sterilized spatula or appropriate equipment to randomly obtain sample increments, with 1/3 of the increments taken from each section. (For 1 kg solid, take 16 equal increments. Eighteen sample increments may be taken to allow 6 increments from each part.) Combine all sample increments to form the composite sample for laboratory testing.



2.5 Collect the sample, documenting the process, and shipping

The sampling agent must ensure that all equipment to be used is appropriately cleaned to eliminate cross contamination. New disposable sampling devices and containers should be used when possible.

Sampling tools and needed items

- Forms to document sampling procedure
- Sample container(s)
- Alcohol wipes
- Disposable gloves
- Stainless steel spatulas, forceps knives and/or disposable or pipettes and syringes
- Decontaminated surfaces for sample processing
- Labels and pens with permanent ink
- Evidence tape or sealing tape

Follow the procedure for taking a representative composite sample. All sample increments should be placed in a single container which will represent the composite sample for laboratory testing.

Documentation

Document the sampling process and retain for your records. The Hemp Program has an example form for post-harvest representative sampling that can be used to document your steps.

Recommended Chain of Custody Record and Sample Preservation

The Hemp Program recommends using a chain of custody form for each process lot. This may be a requirement by the certified laboratory.

A chain of custody form will provide evidence of each time the composite sample changes custody, is transported, and when received at the certified laboratory.

Package the representative composite sample for transport and follow laboratory guidance for preservation.

Table 1 Testing Requirements, the Vermont Hemp Rules

Sample type	potency	moisture or water activity	Microbiological (mycotoxins, total aerobic microbial, total combined yeast and mold)	heavy metals	pesticides	Residual solvents
Plant material						
Trim flower	Note 1	Each process lot	Each process lot	Note 1	Note 1	N/A
Concentrates						
Liquids	Each process lot		Each process lot	Each process lot	Each process lot	Note 3
Solids	Each process lot		Each process lot	Each process lot	Each process lot	Note 3
Infused products						
Liquid-infused products (tinctures, water based)	Note 4		Note 2	Note 1 or 2	Note 2	N/A
Solid-infused products, edibles, tablets	Note 4		Note 2	Note 1 or 2	Note 2	N/A

Note 1: Testing completed for harvest lot is sufficient for showing compliance.

Note 2: Testing completed for trim flower or hemp concentrate is sufficient for showing compliance.

Note 3: Residual solvents are tested only if solvent-based extraction techniques are used. Note 4: Please apply [Vermont Hemp Rules](#) Section 8.3 (a) for potency.

Table 2 For Hemp trim flower, and hemp pre-rolls (EXCLUDING infused pre-rolls):

Process lot Weight Range	Minimum number of sample increments
≤ 2.5 kg	13 samples
2.5 kg < w ≤ 5 kg	19 samples
5 kg < w ≤ 7.5 kg	16 samples
7.5 kg < w ≤ 10 kg	22 samples

Table 3 For unpackaged servings or prepackaged retail units of hemp-infused products:

# of Unpackaged servings or Pre-packaged Units in a Process Lot	Composite sample**
≤ 50	2 servings/units
51 -150	3 servings/units
151 - 500	5 servings/units
501-1200	8 servings/units
1201 -3200	13 servings/units
3201-10000	20 servings/units

** Depending on the weight of a prepackaged unit, more than the listed number units may need to be taken to make up the composite sample. Consult with the certified laboratory conducting the analyses to confirm the appropriate number of servings or units to collect.

Table 4 For solid, semi-solid, or liquid hemp concentrates:

Processing Lot Weight	Minimum number of Samples for the Composite Sample
≤ 0.5 kg	12 samples
0.5 kg < w ≤ 1 kg	16 samples
1 kg < w ≤ 1.5 kg	20 samples

Hemp Post-Harvest Sampling Guidance for Process Lots

$1.5 \text{ kg} < w \leq 2 \text{ kg}$	24 samples
$2 \text{ kg} < w \leq 5 \text{ kg}$	28 samples